SIXTEENTH QUARTERLY PROGRESS REPORT

ON A

REGIONAL TECHNOLOGY TRANSFER PROGRAM

June 1, 1968 -- August 31, 1968

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REGIONAL TECHNOLOGY TRANSFER PROGRAM

NORTH CAROLINA SCIENCE AND TECHNOLOGY RESEARCH CENTER

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Post Office Box 12235

Research Triangle Park, North Carolina 27709

Contract NSR 34-007-006

Period Covered: June 1, 1968 -- August 31, 1968

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ABSTRACT

North Carolina Science and Technology Research Center, Research Triangle Park, North Carolina.
SIXTEENTH QUARTERLY PROGRESS REPORT ON A REGIONAL TECHNOLOGY TRANSFER PROGRAM, June 1, 1968 -- August 31, 1968.
Contract NSR 34-007-006

During the first quarter of the present contract period, the Center furnished service to 31 companies, universities and organizations. Marketing efforts were concentrated on prospective clients previously contacted in North and South Carolina and Virginia.

A total of 48 retrospective searches and 128 computer updates resulted in 5,166 evaluated abstracts and 908 complete documents being provided to clients. The inverted file search system was further refined, and computer indexes to Textile Technology Digest were secured from the Institute of Textile Technology as an information resource. The Center has extended its experimental Graduate Student Program for the second academic year.

Seven cases of technology transfer and program impact are reported.

NORTH CAROLINA SCIENCE AND TECHNOLOGY RESEARCH CENTER

SIXTEENTH QUARTERLY PROGRESS REPORT

I. INTRODUCTION

This is the Sixteenth Quarterly Progress Report to be submitted to the Technology Utilization Division of the National Aeronautics and Space Administration by the North Carolina Science and Technology Research Center. It is the first report under Contract NSR 34-007-006, and describes the continuing operation of a regional dissemination center for new technology. The program was started in June 1964 under Contract NASr-235 and continued under Contract NSR 34-007-003 through May 30, 1968. Program support is also provided by the North Carolina Board of Science and Technology and by subscription fees from participating companies.

Objectives of the experimental program are the selective provision of scientific and technical information and related services to fee-paying subscribers.

II. STRC OPERATIONS

A. Staff and Facilities

The North Carolina Science and Technology Research Center is housed in its own modern building in Research Triangle Park, in close proximity to the three Triangle universities.

On June 1, 1968, the beginning of the present report period, the staff consisted of:

the director
the assistant director for operations (part-time consultant)
the assistant director for marketing
the technology utilization manager
three applications engineers

an information specialist
(part-time consultant)
a computer programmer
a technical editor
an assistant librarian
a technical assistant
an accountant
two secretaries
six clerical assistants

During the report period, a graduate engineer was employed on a temporary basis to develop a computerized cost-accounting system, and one applications engineer resigned to accept employment with private industry.

B. Services Provided

During this report period, STRC served 31 clients on an annual subscription basis, and 12 on a "demand" basis. The latter group is composed largely of faculty at regional universities who utilize the services of STRC periodically in connection with consulting work or contractual research projects. Table I shows services furnished to regular and special clients. Table II classifies documents distributed by STAR category for the report period and for the preceding year.

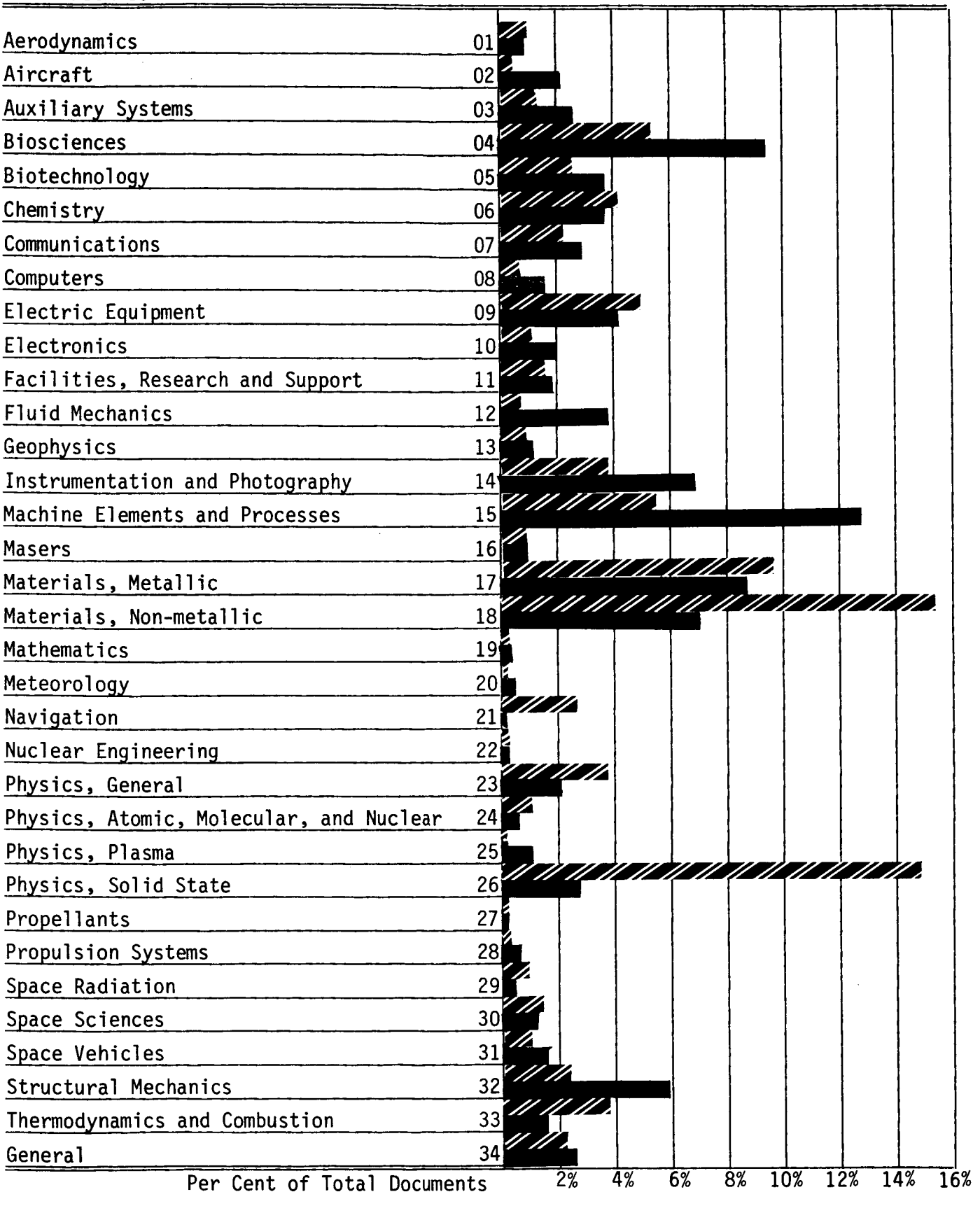
TABLE I

SERVICES PROVIDED

	Jun-Aug 1968	Apr-May 1968 (2 months)	Jan-Mar 1968	Oct-Dec 1967	Jul-Sep 1967
Retrospective Searches:					
Regular Clients	48	34	53	30	54
Graduate Students	0	0	106	52	
Current Awareness Searches	128	51	158	200	
Documents Sent	908	525	745	680	520
Pages Reproduced:					
Xerox	6,031	3,978	12,793	5,634	8,570
From Microfiche	13,651	8,894	15,125	12,485	7,046
Hard Copy Sent:					
From STRC Stock	99	77	162	71	40
From STIF	23	24	32	29	48
From CFSTI	180	110	140	79	30

CLASSIFICATION OF DOCUMENTS DISSEMINATED

TABLE II



C. Marketing

Although some new companies were contacted, the chief marketing effort for this 3-month period was centered on those organizations previously screened, identified and contacted as potential clients. Mr. L. M. Kelly, assistant director for marketing, traveled extensively in North Carolina, South Carolina, and Virginia, often accompanied by an applications engineer. Many other companies classified as potential clients received an introductory letter and a copy of the STRC brochure "Information from Aerospace Research to Productive Application." The introductory letters will be followed by a telephone call, personal visit, or both.

The following tables attempt to analyze STRC clients. Table III lists the three types of organizations which utilize STRC services; a further breakdown is made between those organizations which subscribe on an annual basis and those who make fairly regular use of the service, but only "on demand" to fit a particular situation.

Table IV provides a breakdown by two-digit SIC classification. It is easily noted that the two largest categories among STRC's manufacturing clients are Chemicals and Allied Products, and Electrical Machinery, Equipment and Supplies. Both categories have grown in the current report period.

Table V shows the size of STRC manufacturing clients by number of employees. Although the center's point of contact is usually the R&D department, size in this table is based on the total number of employees throughout the parent organization.

A map on page 8 indicates areas where STRC is presently serving industry, as well as those areas where potential clients have been identified and contacted. Two other states, Louisiana and West Virginia, are being considered for possible future exploration.

TABLE III

STRC CLIENTS BY TYPE OF ORGANIZATION

TYPE	NUMBER	
Annual Subscribers	June 1, 1968	August 31, 1968
Manufacturing Firms	29	29
Consulting Engineers	1	1
Research Organizations	1	1
Demand Users		
Manufacturing Firms	1	2
Research Organizations	1	1
Educational Institutions	10	9

TABLE IV

MANUFACTURING FIRMS ON ANNUAL SUBSCRIPTION BASIS
BY SIC CLASSIFICATIONS

CLASSIFICATION	NUMBER CLIENTS*	
	June 1, 1968	August 31, 1968
19 Ordnance and Accessories	1	1
21 Tobacco Manufactures	1	1
22 Textile Mill Products	3	3
23 Apparel	1	0
28 Chemicals and Allied Products	8	9
31 Leather	1	0
32 Stone, Clay and Glass Products	1	1
33 Primary Metal Industries	2	2
35 Machinery, except electrical	4	3
36 Electrical Machinery, Equipment and Supplies	8	10
38 Professional, Scientific and Controlling Instruments; Photographic and Optical Goods; Watches and Clocks	1	0
39 Misc. Manufacturing Industries	1	2

*Some clients have more than one classification

TABLE V

STRC MANUFACTURING CLIENTS BY COMPANY SIZE

NUMBER EMPLOYEES	NUMBER CLIENTS* June 1, 1968	August 31, 1968
1 - 25	3	3
26 - 50	3	1
51 - 100	1	1
101 - 250	5	6
251 - 500	4	4
501 - 1000	4	5
1001 - 1500	4	4
1501 - 2500	1	1
2501 - 3500	2	2
3501 - over	2	2
TOTALS	29	29

*Two clients do not divulge company size

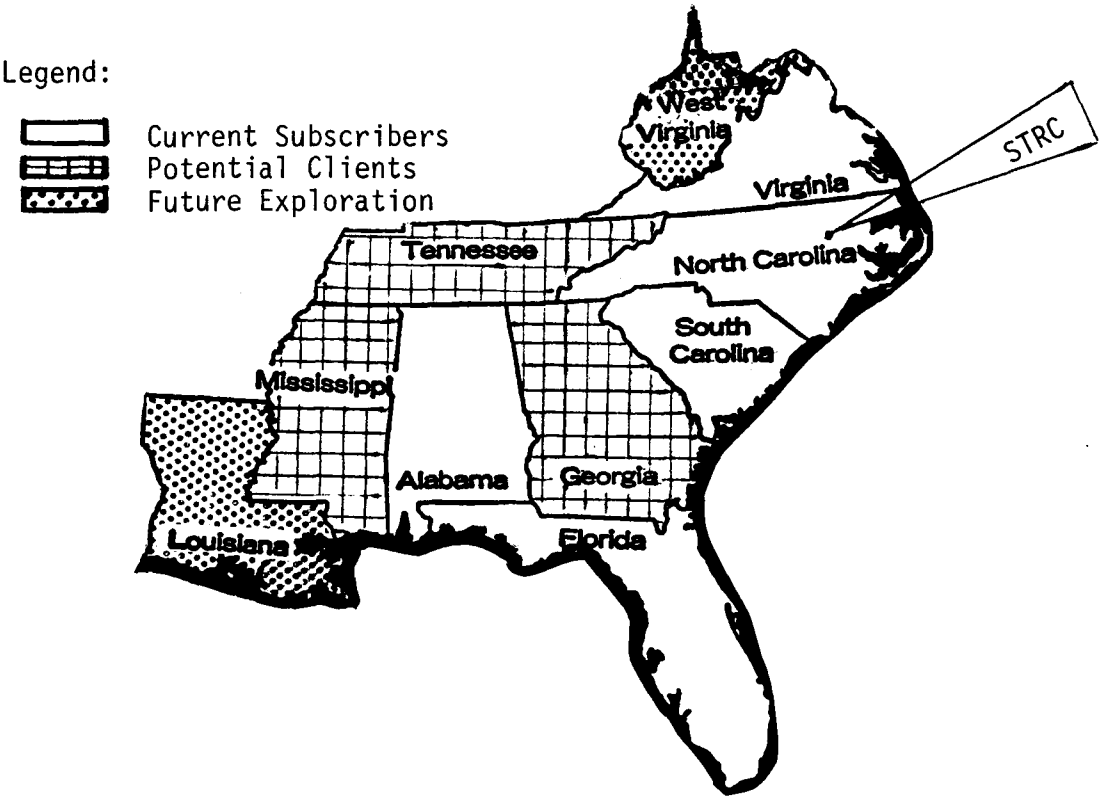
During this period, the marketing director and applications engineers kept a running tally of all contacts with industry. Table VI is a compilation of these contacts. Appendix B-4 shows individual tally sheet.

TABLE VI

CLIENT CONTACTS

TYPE	CONTACTS	JUNE	JULY	AUGUST	TOTALS
Technical	Visits Organizations	13	12	18	43
	*Individuals	55	37	23	115
	Letters	32	40	47	119
	Telephone	97	76	90	263
Marketing	Visits Organizations	30	16	8	54
	*Individuals	60	32	15	107
	Letters	35	18	103	156
	Telephone	37	46	21	104

*Personal contacts within organizations



Area of Service . . . Southeastern States

D. Information Resources

During the period of this report, an agreement was reached with the Institute of Textile Technology at Charlottesville, Virginia, for the use by STRC of the computer-indexed files of Textile Technology Digest. The Digest is an abstract journal covering textile literature and patents and announces about 10,000 items per year. Computer-indexed files are available beginning with January 1966.

A portion of the computer search file has been received, installed, and tested by sample searches. A complete file of the journal is on hand. There is considerable interest among present and potential STRC subscribers in this file, and we expect that its availability will bring in a number of textile companies who have previously been unwilling to subscribe for the NASA information resource alone.

E. Computer Activities (Retrieval System)

The inverted search system developed by STRC for use on IBM System 360 series computers was designed with flexible capabilities for file construction and maintenance. This flexibility has been demonstrated in two ways to date. Normal search operations of the NASA information resource are run on the IBM S/360 Model 75 computer with 2314 disk storage device (large disk) located in the STRC building. Search programs have been successfully run also on the IBM S/360 Model 40 computer with 2314 disk storage at N. C. State University.

The second test of system flexibility came in the creation of separate textile information and DDC files. These files were prepared without difficulty and are searched using the same routines as those for the NASA file.

All update searching for current awareness profiles has been transferred from the 1410 linear search system to the STRC-IVS system. A sufficiently large number of both retrospective and current awareness searches has been run to establish operating costs and to provide a basis for estimating search costs before they are made.

F. Special Projects

1. Cost Study

Under Article I-D of Contract NSR 34-007-006, STRC is required to perform a detailed study of the costs of providing services to subscribers. Two parts of this cost study have now been completed.

An analysis of cost records maintained by STRC has resulted in the adoption of the job order system used last year for the Graduate Student Search program for all search services to all classes of subscribers. A job cost record (see Appendix B) is issued whenever a search is made, and

is used to collect all kinds of costs incurred in performing the search and providing subsequent documentation. These cost records will be summarized periodically to develop average costs for each service provided by STRC.

Two computer programs were prepared to summarize and analyze cost data from various records maintained at STRC. Labor cards prepared by all employees will be summarized to insure that costs not directly related to a particular search are not overlooked in pricing services.

2. Marketing Study

As a part of its responsibilities under this contract, STRC has undertaken an extensive study of the market for technology utilization in the southeastern region which it serves. A former senior applications engineer has been employed as a consultant to complete this study, which will be reported in depth at its conclusion.

3. Graduate Student Search Program

For the second academic year, STRC will make available to qualified graduate students the resources of the NASA information bank. During the 1967-68 school year, STRC ran 155 searches for graduate students at 5 schools in North Carolina and 7 schools in other Southeastern states. Under the present contract, the program will be expanded. Institutions selected to participate in this experimental program include:

NORTH CAROLINA - University of North Carolina at Chapel Hill
University of North Carolina at Greensboro
University of North Carolina at Charlotte
North Carolina State University
Duke University
Wake Forest University
East Carolina University

SOUTH CAROLINA	- University of South Carolina Clemson University
GEORGIA	- Georgia Institute of Technology
MISSISSIPPI	- Mississippi State University University of Mississippi
ALABAMA	- Auburn University University of Alabama
FLORIDA	- University of Florida
VIRGINIA	- University of Virginia Virginia Polytechnic Institute
TENNESSEE	University of Tennessee

Engineers from STRC will serve as coordinators of the project, aiding the individual student in defining his exact interest and translating that interest into computer terminology. Searches will be run on the STRC inverted search file at the Triangle Universities Computation Center, utilizing TUCC's IBM 360/75 computer.

Letters (Appendix B-1) have been sent to the presidents of the universities involved, explaining the program and requesting their cooperation in bringing it to the attention of department heads and faculty members. Flyers (Appendix B-2) have been prepared and will be distributed to all the schools, posted on bulletin boards, and mailed in answer to inquiries. News releases have been sent to all news media in North Carolina, to the respective campus newspapers, and to large city dailies in the states involved.

Cost and time records will be maintained, employing a form (Appendix B-3) on which will be entered the nature of each job performed in connection with a student search, and the time required to complete the job. Tabulations will be run at the end of the program period and incorporated into an overall report on the project.

A potential benefit from the program to STRC is illustrated by the following two cases:

> The assistant director for marketing made an initial call on a large industry in South Carolina. He received a warm welcome and was informed that the industry was already aware of the capabilities of STRC through one of its consultants, a full-time professor at a neighboring university. The professor had become indoctrinated through the graduate student search program. The industry also employed an engineer who had used the search program as a graduate student and was enthusiastic about its effectiveness. The company became a subscriber to the services of STRC; one of the motivating factors was the familiarity with and acceptance of the service by the consultant and an employee.
>
> At a second industry, the marketing director found that a consultant to the company was familiar with the Technology Utilization program through the graduate student searches made for his students the previous year. Again, the influence of the consultant was instrumental in obtaining a company subscription for information services from STRC.

Two aspects of the program which were disappointing last year are receiving special attention this year. A study has been underway to determine how to interest physics and mathematics students in the program. As was mentioned in the report on last year's program, most physics faculty feel self-sufficient with regard to technical information. However, a series of three trial searches turned up several documents previously unknown to some physics graduate students at NCSU. Their recommendation, expected to be positive in favor of the program, should help convince others

to make the experiment.

The second aspect is the service the program can be to business students. STRC staff members are now working on a possible seminar series to be held in the Spring Semester at UNC-CH entitled "Technology Advances for Business Executives." The course will be an effort to acquaint present and future business executives with advances in technology which may offer significant opportunities and competitive advantages in the near future. It is hoped that feedback from this course will help STRC in developing better techniques to serve management personnel.

Results of the 1967-68 experimental graduate program are given in detail in TR-103, Results of an Experimental Program to Provide Low Cost Computer Searches of the NASA Information File to University Graduate Students in the Southeast, published by STRC in July 1968.

III. UNIVERSITY RELATIONS

STRC is closely tied by mutual interests, professional association and support, and extensive social contacts to the three Triangle universities -- Duke, the University of North Carolina at Chapel Hill, and North Carolina State University in Raleigh. At the present time, STRC is working in three major areas with these universities. Two areas are cited below; one other area is reported separately under F. 3. Graduate Student Program.

(1) STRC participates actively in the State Technical Services program, administered in North Carolina by Dr. W. L. Turner, Administrative Dean for University Extension at NCSU. The Industrial Extension Service, which is responsible for NCSU's activity in the program, has recently undertaken a program of assistance to the furniture industry in North Carolina. A common problem in the industry is the stretch of fabrics used to cover cushions. STRC will supply assistance to the program by helping to locate

suitable backing materials, coatings, or cutting techniques to minimize the losses resulting from ill-fitting cushion covers.

(2) The school of Textiles at N. C. State University, under the leadership of its new dean, Dr. David M. Chaney, has embarked on an extensive program of service to the textile industry. An activity in this program will be the establishment of a modern information retrieval service more intensive than any yet developed to serve this industry. Using the work of Professor Stanley Backer of M. I. T. as the foundation, the effort will be directed toward developing a retrieval system compatible with local computing equipment and indexing and abstracting local textile library holdings and new acquisitions. Mr. Dennis M. Phillips, STRC Information Specialist, will direct the activity on a half-time basis. Mr. Phillips' participation in the program will insure that the information bank is in a form searchable by the STRC retrieval system. Also, since the N. C. State textile file will utilize the same computer used by STRC, it will be relatively simple for STRC to purchase searches of this file for its customers.

IV. MEETINGS, TRIPS, AND VISITS

A. Meetings and Trips

During this report period, STRC staff members made the following contacts:

June 3-6, Mr. Chenery, D. M. Phillips, and F. O. Smetana attended a Regional Dissemination Center directors meeting at NASA's Langley Research Center, Hampton, Virginia.

June 7, Mrs. Mary Ann Williamson and D. M. Phillips visited the Institute of Textile Technology in Charlottesville, Virginia on the subject of adding the ITT information file to the Center's information resources.

June 12, Mr. Chenery and D. M. Phillips conferred with Dr. Douglas H. K. Lee of the National Environmental Health Sciences Center, Research Triangle Park, on the Health Center's information retrieval problems.

June 28, D. M. Phillips visited Philip Morris, Incorporated in Richmond, Virginia to discuss STRC computing activities.

July 1, D. M. Phillips talked to representatives of the Occupational Research Coordinating Center, Raleigh, concerning information retrieval.

August 8, Mr. Chenery addressed the Research Triangle Park Rotary Club on the functions of STRC and its parent organization, the North Carolina Board of Science and Technology.

B. Visitors

July 31, The Science and Technology Research Center was host to a distinguished group of visitors from North Carolina state government, including Governor Dan Moore and former Governor Luther H. Hodges. The occasion was an inspection and review of the facilities and work of the Center and its parent organization, the North Carolina Board of Science and Technology, by the Advisory Budget Commission. This commission consists of State Senator Tom White, Chairman; State Representative Gordon Greenwood; State Senator Lindsay C. Warren; State Senator Ralph Scott; State Representative Joseph E. Eagles; and Mr. Ed O'Herron of Charlotte.

The commission was accompanied by Mr. G. Andrew Jones, State Budget Officer; Mr. Wayne Corpening, Director of the Department of Administration; Mr. Frank Turner, State Property Control Officer, members of the Governor's staff, and several members of the General Assembly.

Following a slide presentation by Mr. Chenery on the work of the Board and STRC's Technology Utilization Program, the visitors were taken on a tour of the building and its facilities, after which former Governor Luther Hodges closed the presentation with remarks on the overall development of Research Triangle Park.

August 19, Mr. Theodore D. Browne of the Denver Research Institute visited STRC to discuss the "Project for the Analysis of Technology Transfer" being carried out by DRI.

V. PLANS FOR NEXT QUARTER

Information resources at STRC will be broadened by the addition of the unclassified unlimited Department of Defense file, and by the completion of the textile information file of the Institute of Textile Technology. The addition of these resources should make STRC services more attractive to the textile industry, and to other industry groups.

The creation of a bibliographic citation file to complement the NASA key-word file is planned when additional large-capacity computer storage is added to the TUCC system later this year.

A former STRC applications engineer has been employed as a consultant to assist in the graduate student search program. Visits will be made to all participating campuses, and search strategies will be developed during conferences with participating graduate students.

Work will continue on market and cost studies scheduled for completion by December 1, 1968.

Appendix A

IMPACT REPORTS

Appendix A

IMPACT REPORTS

CASE NO. 19

For several months, STRC has been endeavoring to assist a client (Code No. 0232) in developing a more effective screening of the exhaust air in grain drying equipment. The problem is twofold: to prevent loss of high protein particulate matter, and to prevent air pollution from these same particles.

As previously reported, STRC conducted a computer search and a manual search on the subject, both of which failed to produce any information of value. Dr. F. O. Smetana, STRC's Assistant Director for Operations and Professor of Mechanical Engineering at N. C. State University, then met with engineers from the client's staff and made a study of the problem and possible solutions. He also made recommendations for the increased efficiency of the dust-skimming equipment presently used.

Recently, an article on a closely allied subject, total air pollution control, attracted the attention of STRC Applications Engineer J. Graves Vann. Mr. Vann reviewed the subject file, recognized the overlapping of interests and capabilities, and contacted the client in question. As a result, a meeting has now been scheduled between the client and STRC engineers to plan a surveillance of literature on air pollution and its control with the long range objective of determining if and to what degree this company might participate in a relatively new market which is expected to burgeon in the next decade. The continuing problem originally posed will also be covered in the light of the larger, broader scope.

CASE NO. 46

This case is a continuing one, first reported in the Sixth Quarterly Report, October 1 to December 31, 1965, and pertains to a client involved in metallurgical research. Use of the company name is prohibited; its STRC code number is 0257.

Client No. 0257 is interested in the use of ultrasonics in determining the physical properties of metals. The original subject was redefined in the light of a better understanding of the client's interest and is currently stated as a determination of atomic and molecular properties of metals and metal alloys (solid state), and in the mapping of Fermi surfaces by the use of ultrasonic techniques.

This redefined interest area was established in January 1966, and has received continuous attention since that time. An evaluation of information transmitted to this client is presently impossible; the material is very basic and thus unlikely to provide reportable applications of the research. However, the client's continued interest in this area indicates that he places great value on the information received.

CASE NO. 66

In its Seventh Quarterly Progress Report, dated March 31, 1966, STRC reported assistance given Mr. Joseph Pearsall, an independent inventor of Durham, North Carolina, on development of a carbon monoxide detector. With the cooperation of its chemical and electronic engineers, STRC ran searches in the areas of chemistry, biosciences, and auxiliary systems. Mr. Pearsall was referred to the Small Business Administration, a patent attorney, a supplier of platinum-coated wire, and to an independent research organization.

In March 1967, a meeting was arranged between Mr. Pearsall and an electrochemist at Duke University in Durham for further laboratory investigations.

Recently, Mr. Arthur Lockwood, STRC chemical engineer, contacted Mr. Pearsall to determine the present status of the project. He was told that investigations aimed at finding an alternate catalyst for manganese dioxide, which has a very short life, are being continued by Dr. E. C. Toren, the electrochemist from Duke. Dr. Toren is presently on sabbatical in Europe, where some of the work will be done in association with a Ph.D. candidate, also from Duke.

Mr. Pearsall was most appreciate of the help given by STRC from the beginning of the project. Although the detector is still not patented, its development is progressing satisfactorily and no barrier to its patentability has been discovered.

CASE NO. 84

Since January 1966, STRC has serviced for Client No. 0257 a continuing interest area on metal corrosion and corrosion prevention technology. The case has remained relatively unchanged since it was first reported in the Ninth Quarterly Report.

The steady transmittal of pertinent information on this economically important problem has kept this major producer of metal products aware of the latest technology on the subject. Since most of the information represents basic research, its benefits cannot be accurately measured at this time.

CASE NO. 106

As reported in STRC's Thirteenth Quarterly Report, Client No. 0354 has requested assistance from STRC in determining the cause of excessive corrosion on cylindrical tubes used as a piston in hydraulic car lifts. Roller burnishing was being used to obtain the final finish.

After a computer search of NASA material and a manual search conducted

at North Carolina State University had revealed little of value on the subject of roller burnishing and corrosion, STRC arranged for a consultant metallurgist, Mr. Jerry Waller, to visit the client's facilities. A diagnosis of several distinct forms of corrosion on the tubes was made by Mr. Waller, and samples taken for more detailed laboratory analysis. The Fourteenth Quarterly Report discusses aspects of the problem at length.

After extensive research and analysis, the consultant reported that the burnishing operation significantly increased the corrosion susceptibility of the tubes. This finding has now led the client to the decision to eliminate the burnishing operation from the manufacturing process entirely and to substitute centerless grinding.

An exact evaluation of the economic benefits in the case has yet to be made. The client had been experiencing greater difficulties with corrosion than had its competitors; any reduction of problem areas with a product increases the strength of that product in a competitive market, and eventually should result in greater dollar profits for the company.

In this particular case, STRC was able to provide the client with expert diagnosis and recommendations which, it is expected, will eliminate a serious deficiency in the client's product.

CASE NO. 108

First reported in STRC's Fifteenth Quarterly Progress Report (January 1, 1968 -- March 31, 1968), a case of technology transfer was picked up by the Plastics Technical Evaluation Center at Picatinny Arsenal and cited in PLASTEC Report 34 issued in May 1968.

The case described the adaptation of plastic-faced foam sandwich panels to the construction of a refrigerated truck body manufactured by a North

Carolina company. An export version of the truck body is being considered, and PLASTEC commented that the concept of a van which could be disconnected from both the motor unit and the undercarriage is "worthy of consideration for military usage."

Consulting

CASE NO. 24

Dr. F. O. Smetana, assistant director for operations and professor of Mechanical Engineering at North Carolina State University, acted as consultant to an STRC client which has since converted from an "on-demand" basis to a full subscribing contract.

The client industry (0234) intends to do some fundamental studies on the physics of fibers at low temperatures and pressures. Dr. Smetana advised them on the construction of vaccum Dewars for liquid helium service which could also be used to perform tests for this work.

Appendix B

EXHIBITS

SPACE AGE ASSISTANCE FOR BUSINESS / INDUSTRY

North Carolina Science and Technology Research Center

RESEARCH TRIANGLE PARK, N. C. 27709

P. O. Box 12235

Telephones: Area Code 919
Durham 549-8291
Raleigh 834-7357
Chapel Hill 929-6688

Dear Sir:

Enclosed is a copy of a report we have prepared for the National Aeronautics and Space Administration (NASA) which describes an experimental program to provide assistance to graduate students conducting literature research in support of their thesis investigations. I thought that, as an educator, you might be interested in this program.

The program was made available to 155 graduate students in a wide variety of disciplines at twelve universities in the Southeast. As you will note from the report, 90% of the students participating in the program completed the questionnaire, and most responses were highly favorable. For this reason, NASA has decided to provide funds so that the program can be continued and expanded. For $, a search on a particular question or topic will be conducted by computer through a file of more than 400,000 documents which NASA has indexed and abstracted for its own use since 1962. This file is assembled from foreign and domestic journals and report literature on topics of interest to the scientists and engineers working on every aspect of aeronautical and space research. Approximately 70,000 new accessions are now being added each year.

This experimental program is being conducted for NASA by the North Carolina Science and Technology Research Center, an agency of state government, in conjunction with its regular activity of disseminating scientific and technical information to industrial and academic subscribers. The usual fee paid by these subscribers for the service being offered to graduate students is $75. Administrative costs for this program are shared jointly by NASA and the State of North Carolina.

Quite frankly, NASA has an interest in assisting graduate students with their thesis research over and beyond that of simply providing an aid to education. It recognizes that graduate students, particularly those in the natural sciences and in engineering will shortly assume key positions in our technological society. By demonstrating to these individuals through their own experience the value of a broader base of knowledge than is usually available, a rapid,

sophisticated, and relatively inexpensive means of retrieving pertinent information and the improvement to be had in product and process performance and economics by the infusion of new technology, NASA hopes to speed the diffusion of new technology into the commercial market and to bring about more general awareness of the mechanics and utility of computerized information retrieval.

My regular association as Professor of Mechanical and Aerospace Engineering at North Carolina State University has convinced me of the value of the service both to my own research and to that of my students. We have found, however, that in some areas of chemistry and the life sciences, information in the NASA file is largely of a peripheral nature. Unless the student is willing to accept such information and attempt to study for himself its relationship to his problem (and quite a few have done this) he will finally conclude it is not to his advantage to have a search made. This fact, however, helps us to circumscribe the region over which we can be of service.

As you can recognize, this program is rather costly; thus, the number of students for whom searches can be run is limited. Your institution has tentatively been allocated graduate student searches.

In order to complete the evaluation of the program in time to meet our March 15 reporting date, we desire that those students seeking to avail themselves of this service complete the definition of their computer problems prior to December 31, 1968. For these reasons, I would urge you to bring this program to the attention of appropriate faculty and students as soon as possible. Col. Lem M. Kelly, our Assistant Director for Marketing, will contact you by telephone in a few days to coordinate an early visit to your campus to answer any questions which you and your students may have about the program.

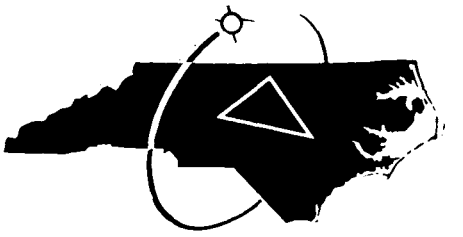
Yours very truly,

Frederick O. Smetana
Assistant Director for Operations

FOS:bw

Enclosures

P. S. I have enclosed a list of the major topics contained in the NASA bank of information and a sample folder used by the student in his request for and evaluation of the program.



LET OUR COMPUTER SUPPORT YOUR THESIS RESEARCH AND INFORMATION NEEDS

The North Carolina Science and Technology Research Center (STRC) in Research Triangle Park is offering the resources of its massive computerized bank of information to graduate students as a supplement to their literature research. This experimental project is supported by the National Aeronautics and Space Administration to seek better ways of disseminating scientific information.

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